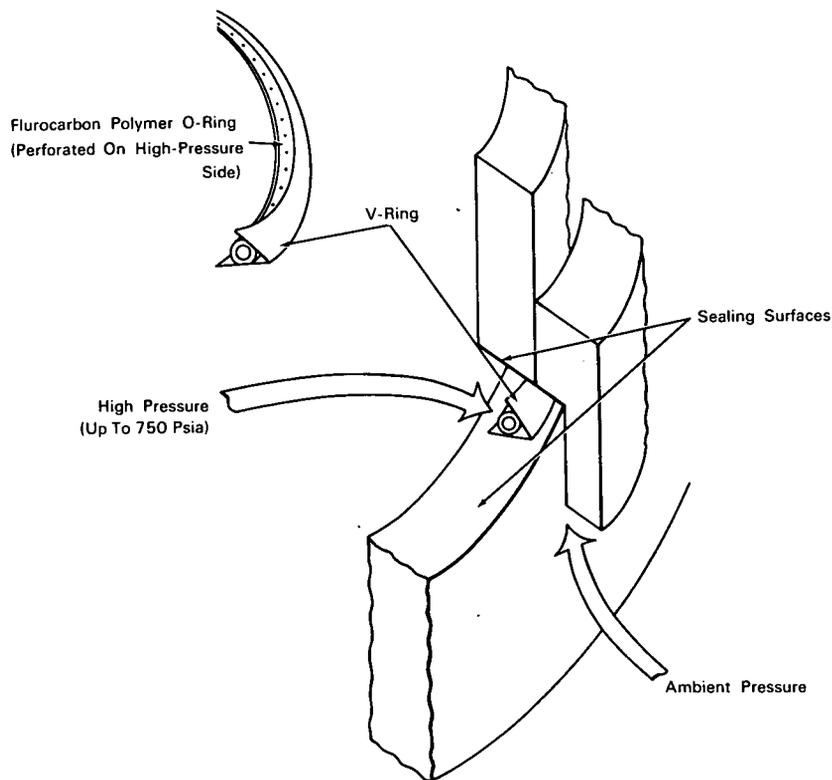


# NASA TECH BRIEF



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## Low-Cost Seal Compensates for Surface Irregularities



**The problem:** Providing a large, inexpensive seal that can be used between surfaces without close-tolerance finishes or precise parallelism. The seal must provide a barrier to leakage of gaseous and liquid hydrogen at pressures of up to 750 psia within the temperature range of +250° to -420° F.

**The solution:** A seal consisting of a metal V-ring and a polyfluorocarbon O-ring.

**How it's done:** The seal assembly consists of two components: a stainless steel ring with a V-notch extending around the outer periphery of the ring, and a perforated tubular O-ring of a fluorocarbon polymer inserted in the mouth of the V. The perforations extend only through the wall of the O-ring exposed to the fluid pressure. Upon application of pressure, the O-ring is forced towards the apex of the V, thereby expanding the ends of the V against the surfaces to be

(continued overleaf)

sealed. Both components of the seal are installed with a preload to provide initial sealing action.

**Notes:**

1. To improve the sealing characteristics of the ring, the outer surfaces of the V may be coated with a deformable material (e.g., a fluorocarbon polymer, lead, or indium). A solid fluorocarbon polymer O-ring, or a metal O-ring may be used in place of the hollow O-ring to increase the compression load between the outer surfaces of the V and the surfaces to be sealed.

2. A related innovation is described in NASA Tech Brief 64-10327, December 1964. Inquiries may also be directed to:

AEC-NASA Space Nuclear Propulsion Office  
U.S. Atomic Energy Commission  
Washington, D.C., 20545  
ATTN: Technology Utilization Branch  
Reference: B65-10160

**Patent status:** NASA encourages commercial use of this innovation. No patent action is contemplated.

Source: Aerojet-General Corp. under contract to  
AEC-NASA Space Nuclear Propulsion Office  
(NU-0016)